

A satellite view of Earth from space, showing the curvature of the planet, the blue oceans, and the brown and green landmasses. The image is oriented vertically, with the top of the Earth at the top of the frame.

Graduate School of

# E nvironmental Science

Division of Environmental Science Development

Division of Earth System Science

Division of Biosphere Science

Division of Environmental Materials Science

150<sup>th</sup>

HOKKAIDO UNIVERSITY



## Katsuaki Konishi

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### Creating the Future Together

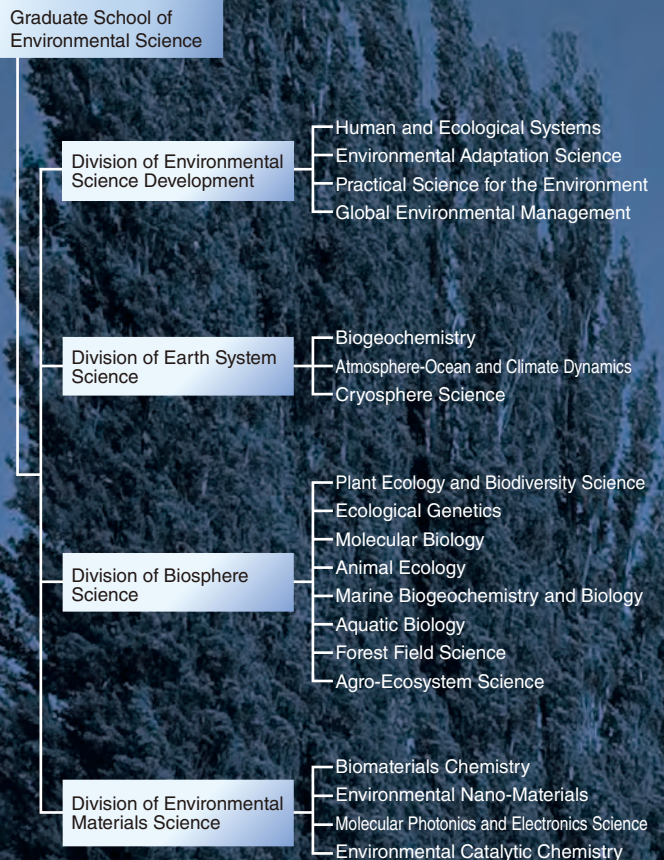
Our graduate School was originally established in 1977 as Japan's first graduate school with "Environmental Science" in its name. Over the decades, it has evolved—from its early days as the Graduate School of Environmental Earth Science to its reorganization in 2005 into the current structure. Throughout this journey, we have worked to understand the complexities of the global environment, uncover the mechanisms behind environmental issues, and propose solutions that address them. Our research has produced scientific knowledge that underpins the basic concepts of the SDGs, while fostering interdisciplinary approaches that connect the natural sciences, social sciences, and humanities.

Today, the world stands at a crossroads. The rise of selfish policies among major powers—accompanied by anti-globalist sentiment and a growing disregard for academia—has made it harder to harness the full potential of science in fostering international cooperation. Meanwhile, extreme weather events such as unprecedented heatwaves and torrential rain/snows are no longer distant warnings; they are urgent realities, reminding us that climate change is already here. Increasing environmental burdens may deprive future generations of their potential.

This is why scientists must both honor the traditions of their disciplines and have the courage to cross disciplinary boundaries to chart new scholarly pathways. Environmental science is not only the pursuit of universal truths about nature—it is also the collaborative effort to work with society in shaping a sustainable future. As reflected in our four diverse divisions, creating a single unifying framework for such a broad field is no easy task. Yet in the post-SDGs era beyond 2030, the role of environmental science as an interdisciplinary bridge will be more critical than ever.

In 2027, our school will celebrate its 50th anniversary—a milestone that echoes the words of Confucius: "At fifty, I knew my destiny." I believe that Hokkaido University's environmental science is also entering a stage of "knowing its destiny," as we look toward shaping the post-SDGs world. To all who wish to join us: I encourage you to step beyond the limits, pursue your work with passion, and share your findings with society. The future is not something to await—it is something we create together.

### Organization



### Participants

Faculty of Environmental Earth Science  
Institute of Low Temperature Science  
Research Institute for Electronic Science  
Institute for Catalysis  
Field Science Center for Northern Biosphere  
Faculty of Fisheries Sciences  
Arctic Research Center  
Faculty of Science

## Division of Environmental Science Development

Humankind is currently facing many environmental issues, represented by global warming, biodiversity reduction, and ecosystem degradation. The advancement of environmental sciences is a prerequisite to save the earth through the conservation, remediation and restoration of ecosystems at various scales. A sustainable and low-carbon society should be created for future generations. The Division of Environmental Science Development has been established for solving these issues based on solid scientific foundations. To progress in the interdisciplinary studies, we mobilize all of the natural and social sciences. Students in this division are expected to understand and solve such environmental issues.

- Course in Human and Ecological Systems
  - Symbiosis in Nature
  - Environmental Geography and Conservation
  - Sustainability and Low-Carbon Society
- Course in Environmental Adaptation Science
  - Environmental Adaptation
  - Reduction of Environmental Impact
  - Environmental Remediation
  - Risk Assessment and Management for Chemicals
- Course in Practical Science for the Environment
  - Education for Sustainable Development (ESD)
  - Environmental Education
  - Earth System Science
  - Civic Pride
- Course in Global Environmental Management
  - Influence of Global Warming
  - Resource and Risk Management
  - Environmental Education
  - International Perspective



<https://www.ees.hokudai.ac.jp/kigaku/?lang=en>

## Division of Earth System Science

This division offers students the opportunity to study Earth sciences and thus understand and predict the Earth's environment and its variability on broad time scales. The division's scope includes detection, attribution, and projection of local- to global-scale environmental and climatic changes. The division has three courses to cover various fields of earth sciences. Each of the courses has an extensive curriculum to provide education of geosciences from fundamental to advanced levels in order to cultivate specialties. The study of the Earth's environment requires interdisciplinary cooperation, so a broad perspective is also required. Thus the division offers multidisciplinary classes as well.

- Course in Biogeochemistry
  - Biogeochemical Cycle,
  - Paleoenvironment and Paleoclimate,
  - Environmental Chemical Analysis,
  - Isotope Analysis of Bio and Geomaterials
  - Field Science of Land, Ocean, and the Atmosphere,
  - Climate Change
- Course in Atmosphere-Ocean and Climate Dynamics
  - Meteorology,
  - Physical Oceanography,
  - Sea Ice and Polar Sciences,
  - Climate System Science,
  - Field Observations, Data Analysis, and Numerical Modeling
- Course in Cryosphere Science
  - Glacier and Ice Sheet Science
  - Cold Region Hydrology and Meteorology
  - Geocryology
  - Ice Core Research

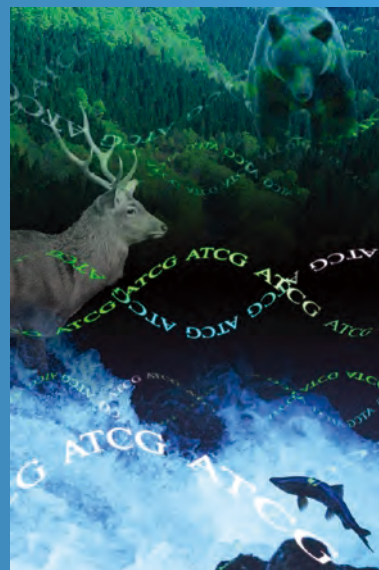


<https://www.ees.hokudai.ac.jp/earth/?lang=en>

## Division of Biosphere Science

The Division of Biosphere Sciences integrates knowledge and techniques from various fields of biology, including ecology, biochemistry, molecular biology, and production science. Through a diverse range of lectures and research guidance, the division aims to nurture promising young researchers capable of making significant contributions to the field. Comprising eight courses, it allows students the flexibility to seek advice from professors of other courses, adapting to the intricate nature of environmental challenges involving living organisms.

- Course in Plant Ecology and Biodiversity Science  
Forest Community, Plant-Animal Interaction, Succession
- Course in Ecological Genetics  
Genetic Diversity, Evolution, Phylogeny, Genome Science
- Course in Molecular Biology  
Environmental Microbiology, Plant Molecular Biology, Bioremediation, Microbial Ecology, Animal Physiology
- Course in Animal Ecology  
Population Ecology, Community Ecology, Conservation Biology
- Course in Marine Biogeochemistry and Biology  
Fisheries Oceanography, Marine Biogeochemistry, Fisheries Physics, Reproductive Fish Physiology, Fish Aquaculture Biology
- Course in Aquatic Biology  
Aquatic Biology, Developmental Biology, Aquatic Ecology
- Course in Forest Field Science  
Forest Ecology, Ecosystem Function
- Course in Agro-ecosystem Science  
Cropping Systems, Land use and Livestock Production Systems, Plant Conservation

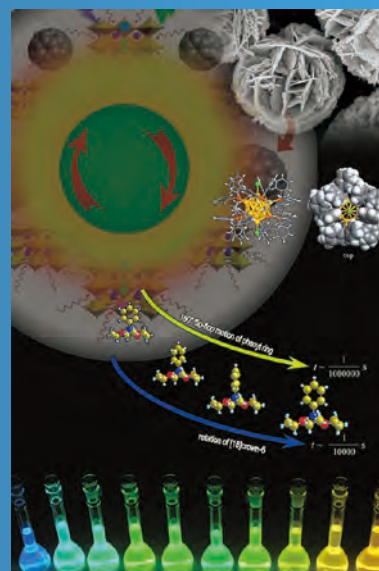


[https://noah.ees.hokudai.ac.jp/bio\\_en/](https://noah.ees.hokudai.ac.jp/bio_en/)

## Division of Environmental Materials Science

Environmental pollution and environmental destruction are serious problems throughout the world. In order to resolve these problems, comprehensive chemistry-based research and understanding of the natural environment are essential, because chemical reactions are the basis of all natural phenomena. The Division of Environmental Materials Science conducts cutting-edge research and special education on the distribution and activity of chemical substances involved in environmental problems and on the development of novel methods for environmental remediation and environmental protection. We foster students' talents so that students can play a central role in problem solving.

- Course in Biomaterials Chemistry  
Synthetic Organic Chemistry, Biotechnology, Marine Natural Product Chemistry
- Course in Environmental Nanomaterials  
Chemosensors, Environmental Electrochemistry, Supramolecular Chemistry, Environmental Catalysis, Environmental dynamic analysis, Porous materials
- Course in Molecular Photonics and Electronics Science  
Supramolecular crystalline materials, Molecular conductors and dielectrics, Molecular magnets, Porous organic materials, Solar energy materials, Fluorescent molecules and nanomaterials, Molecular and bio sensors, Laser trapping crystallization
- Course in Environmental Catalytic Chemistry  
Catalytic chemistry, Heterogeneous Catalysis, Green & sustainable chemistry, Catalytic biomass conversion, Renewable carbon resources, Acid-base Catalysis, Oxidation-reduction catalysis, Plasma catalysis, Synchrotron X-ray characterization, Surface science



<https://www.ees.hokudai.ac.jp/material/?lang=en>

## International programs and affairs

### ■ EPEES program

- English Program of Environmental Earth Science for Sustainable Society (EPEES) is for master's and doctoral courses, started in April of 2014.
- EPEES aims to foster professionals who can contribute to the protection of the global and local environments having broad knowledge.  
The program is conducted entirely in English.

### ■ Other programs

- Student Exchange Support Program (Scholarship for Study in Japan under Agreement)
- Special Grant Program for International Students
- Antarctic Science program
- ABE Initiative program
- SDGs Global Leader Course

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## Information for Students from Overseas

**Education:** We welcome students from overseas. We offer a program taught entirely in English, so a student can get a Master's or Doctoral degree by taking classes only in English. Nevertheless, we recommend that international students learn Japanese, and the Institute for the Advancement of Higher Education, Hokkaido University prepares Japanese language courses.

**Admission:** Entrance examinations are held in June, August, November and February each year. The academic year starts in April, but some Doctoral and Master's courses also start in October. Applicants are strongly advised to contact faculty members in their research field of interest before applying for entrance examinations.

**Scholarship and exchange programs:** Scholarships from Hokkaido University, the Japanese government and other organizations are available for international students. For more information about scholarship, visit Hokkaido University Website (English Main site) <https://www.global.hokudai.ac.jp/admissions/scholarships-for-prospective-students-2/> We also have international exchange programs with other universities. The list of partner institutions is shown at <https://www.global.hokudai.ac.jp/global/inter-university-exchange-agreements/>

### Information

Graduate School of Environmental Science, Hokkaido University  
<https://www.ees.hokudai.ac.jp/en/>



Scholarships for Prospective Students  
<https://www.global.hokudai.ac.jp/admissions/scholarships-for-prospective-students-2/>



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International Agreements  
<https://www.global.hokudai.ac.jp/global/inter-university-exchange-agreements/>



Graduate Admissions  
<https://www.global.hokudai.ac.jp/admissions/graduate-admissions-overview/>



Sapporo



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